

REMARKS/ARGUMENTS

Claims 1-19 stand rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hatsuda et al., EP 1029886 or Wada et al., U.S. Patent 5,760,080. For the reasons set forth hereinafter, it is requested that the Examiner reconsider and withdraw this rejection.

The various water absorbent resins have been developed conventionally by taking into account various properties (speed of absorption, absorbency against no pressure, absorbency against pressure, gel strength, durability, soluble content, particle size, etc.). However, the control of these properties and designs based on these properties were not sufficient to manufacture water absorbent resins that can perform satisfactorily in actual applications.

The present invention was made to solve this conventional problem and provide a water absorbent resin that is suitable for actual applications (that can perform satisfactorily in actual applications).

More specifically, the inventors of the present invention accomplished the invention by finding that a change in absorbency with salt concentration, particularly a change in absorbency under a specific pressure, has a large influence in actual applications as in diapers, and that water absorbent superior to conventional models could be realized when the water absorbent has a constant absorbency (under pressure) and a constant permeability. None of these properties has been conventionally recognized.

The particulate water absorbent of the present invention according to an independent Claim 1 is characterized by containing particulate water absorbent resin in a range of not less than 106 μm and less than 850 μm in particle diameter, the particulate water absorbent having a first salt concentration absorption, index, which is a salt concentration absorption index when ion

exchange water is used as an aqueous solution of a constant salt concentration, of not less than 0.60.

With this characteristic, the absorbency becomes constant irrespective of salt concentration. In this way, the present invention according to an independent Claim 1 provides a particulate water absorbent superior to the conventional water absorbents.

On the other hand, Hatsuda et al., which corresponds to "Document 9" in the section of "Background Art" of the specification of the present invention at the time of entry into the national phase, relates to water absorbent resin powder having high liquid permeability, a manufacturing method of the water absorbent resin powder, and its applications.

The water absorbent resin powder according to Hatsuda et al. is an arbitrarily pulverized water absorbent resin having a bulk density of 0.74(g/ml) or greater, and a water absorbency of 20 (g/g) or greater under pressure of 0.7psi (4.83 kPa.) with respect to a saline solution of 0.9 mass %. This characteristic assures significant improvement of liquid permeability under pressure, compared with the water absorbent resins of conventional art.

However, as stated in the specification of the present invention at Page 9, Lines 11 to 17, the conventional evaluation for evaluating properties of a water absorbent resin using a saline solution (aqueous solution of 0.9 'mass percent sodium chloride) was not always suitable for actual applications because it did not take into account the actual salt concentration of urine. This problem is left unsolved in Hatsuda et al.

Wada et al. discloses an absorbing agent having a diffusing absorbency under pressure of not less than 25 g/g when 60 minutes elapsed after absorption is started, and a water-soluble content is above 0 percent by weight and not more than 7 percent by weight. The absorbing agent

is prepared by surface-crosslinking a precursor of the absorbing agent obtained by performing an aqueous solution polymerization of a hydrophilic unsaturated monomer having not less than 50 mole percent neutralized acrylic acid as a main component using a specific crosslinking agent having a main component composed of an ester compound of a specific polyhydroxy alcohol and an unsaturated carboxylic acid, and a high-boiling component having at least two alcohol structures in a molecule as a specific ratio.

Like Hatsuda et al., Wada et al. fails to disclose an absorbing agent or absorbent product that provides a constant absorbency irrespective of salt concentration of urine, in contrast to the novel particulate water absorbent recited in claim 1 and all of the claims depending therefrom, wherein the absorbency is substantially constant irrespective of salt concentration.

The reason the conventional water absorbent resins did not have enough properties for actual applications has been found to be a gradual change (lowering) of salt concentration of urine as the urine undergoes ion exchange when it diffuses through a diaper from a point of excretion. The present invention according to the independent Claim 1, whose structure is explained herein, provides a superior particulate water absorbent that ensures a constant absorbency irrespective of salt concentration. This feature clearly distinguishes the present invention according to the independent Claim 1 from Hatsuda et al. and Wada et al.

The particulate water absorbent of the present invention according to the independent Claim 2 is characterized by containing particulate water absorbent resin in a range of not less than 106 μm and less than 850 μm in particle diameter, the particulate water absorbent having an absorbency of not less than 50 g/g when impregnated with ion exchange water for 60 minutes against a pressure of 4.83 kPa.

With this characteristic, the absorbency becomes constant substantially irrespective of salt concentration even against a high pressure of 4.83 kPa. In this way, the present invention provides a particulate water absorbent superior to the conventional water absorbents. In other words, the present invention according to the independent Claim 2 provides a particulate water absorbent that ensures a constant absorbency irrespective of salt concentration of urine in actual applications. Therefore, the particulate water absorbent of the present invention can have a high physical property such that the particulate water absorbent of the present invention keeps a constant absorbency irrespective of salt concentration of urine in actual applications or change in salt concentrations of urine at various parts in a diaper.

On the other hand, neither Hatsuda et al. nor Wada et al. discloses such applications under such a high pressure of 4.83 kPa, and therefore, Hatsuda et al. and Wada et al. fail to disclose or suggest anything about an absorbency under such high pressure. Therefore, the present invention according to the independent Claim 2 is clearly different from Hatsuda et al. and Wada et al.

Claims 1-19 stand rejected under 35 U.S.C. §112, first paragraph, based on the Examiner's conclusion that the specification, while being enabling for crosslinked polymers of acrylic acid, does not reasonably provide enablement for polymers of any structure that may contain the required absorption properties. Independent claims 1 and 2, and all of the claims depending therefrom, have been amended to recite that the water-soluble unsaturated monomer mainly contains an acrylic acid and/or a salt (neutralizer) of acrylic acid, as described in the specification on page 12, lines 20-25. Accordingly, the rejection under 35 U.S.C. §112, first paragraph, should now be obviated.

Line 17, Page 38 of the specification at the time of entry into the national phase recites
“aqueous solution of 1 mass percent sodium chloride.”

Claim 3 recites “a second salt concentration absorption index of not less than 0.80 as
measured by the formula (1) when the aqueous solution of a constant salt concentration is an
aqueous solution of 0.10 mass percent sodium chloride”.

Moreover, the value on Table 6 shows that a second salt concentration absorption index
(a second salt concentration absorption index when the aqueous solution of 0.10 mass percent
sodium chloride) is not less than 0.80.

Accordingly, it is clear from the descriptions in Claim 3 and Table 6 that “aqueous
solution of 1 mass percent sodium chloride” is an inadvertent clerical mistake that has been
corrected herein to “aqueous solution of 0.10 mass percent sodium chloride.”

In view of the above amendments and remarks, all of the claims as amended herein
should now be allowable to Applicants, and formal allowance thereof is earnestly solicited.

Respectfully submitted,

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